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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/605,453 | 09/30/2003 | Chi-Fu Tito Hsueh | | 2452 |

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| EXAMINER | |
|---|---|
| LAZORCIK, JASON L | |
| **ART UNIT** | **PAPER NUMBER** |
| 1731 | |

DATE MAILED: 05/31/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/605,453 | HSUEH, CHI-FU TITO | |
| | Examiner | Art Unit | |
| | Jason L. Lazorcik | 1731 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *09/30/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☒ Claim(s) *5 and 12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *09/30/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Information Disclosure Statement*

The listing of references in the specification is not a proper information disclosure statement. MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." The section entitled "cross reference to Related Applications and the accompanying list in paragraph [0001] must therefore be properly amended.

### *Drawings*

The drawings are objected to because there are two drawings labeled Fig. 2A in Figure 2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner,

the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Specifically Fig. 2C indicated in the Brief Description of Drawings is not present in the replacement drawing sheets. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Specification***

Claims 5 and 12 objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claims 5 and 12 both indicate that the heat-treating at liquidus temperature be performed for a limited time such that the interstices between the glass particles are completely filled in but the

surface is not completely even. The parent claim indicates that the article is to be heat treated at liquidus temperature and stopped at some later time which is read as heat-treating for a limited time. The parent claim likewise indicates that the glass flows so as to fill "all the spaces" among the bits which is read as completely filling the spaces among the glass particles. Further, both the parent and dependent claims indicate that the heat treatment process is to be stopped before the surface of the glass is completely even or "flatten down".

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1 through 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashibe (5,089,345) in view of Nakamura (3,964,917), and further in view of Kurahashi (5,403,664).

Regarding Claims 1 and 7, Hashibe teaches a process whereby a glass article having a rough or irregular surface is fabricated by the following steps:

1) Glass balls of less than 10mm diameter (Column 2, Lines 24-25) fabricated from a material capable of forming β -wollastonite crystals(Column 3 Line 22), are prepared consisting essentially of (Column 2, Lines 30-31):

   1a. $SiO_2$ of 50-65%
   1b. $Al_2O_3$ of 3-13%
   1c. CaO of 15-25%
   1d. ZnO of 2-10%

2. Flaky or flattened pieces of a crystallizable glass, also capable of forming β-wollastonite crystals (Column 3, Line 22), are prepared having a thickness of between 0.1-0.5mm (Column 2, Lines 16-22)

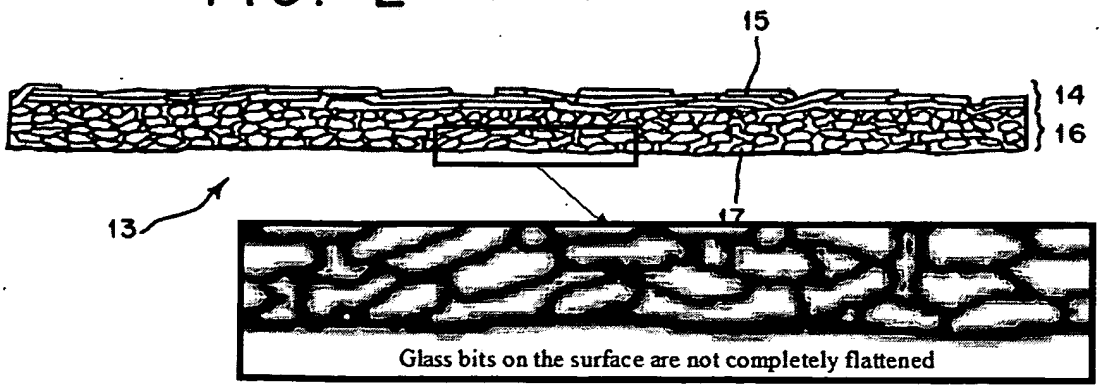
3. The glass flakes are loaded into a mold having a mold release agent coated on the bottom plate (Column 2, Lines 39-40) to form a layer of said flakes followed by loading a layer of glass balls over the flake glass layer (Column 2, Lines 33-41).

4. Heat-treating the glass flakes and balls to a temperature of 1000°C to 1200°C which is higher than the softening point of the crystallizable or crystallized glass (Column 2, Lines44-46). Said heat treatment causes the fusion-bonding of the flakes and balls (Column 2, Lines 46-49) as well as causing the softening and deformation (Column 1, Lines 57-62) of both the glass flakes and glass balls. Further, the heat treatment results in a

densified or non-porous layer in the crystallized glass plate (Column 2 Lines 63-65).

Specifically with respect to Claim 1, the Hashibe process is understood to utilize glass bits or "balls" capable of forming β -wollastonite crystals upon heat-treating at a certain temperature as outlined in (1) above. In (3), Hashibe continues by packing said glass bits into a mold to form a layer. In (4), these glass bits are heat treated at a temperature capable of both causing crystallization of the glass where the crystals are of the β -wollastonite type as well as fusion-bonding said glass bits. Hashibe also specifically notes that the heating is carried out at a temperature above the softening point such that the glass particles deform to produce a dense, non-porous body. This deformation is understood be equivalent to the assertion in Claim 1 where "the glass flow on the surface fills in all the spaces among the fusion-bonded glass bits" thus forming a dense or non-porous body. Further, it is clear from Figure 2 that this heat treatment process is terminated or stopped before the glass bits on the surface are completely flattened:

FIG. 2



Similarly regarding Claim 7, the Hashibe process is understood to utilize glass bits or "balls" capable of forming β -wollastonite crystals upon heat-treating at a certain temperature as outlined in (1) above. Hashibe in (2), lays out the preparation of the glass the flat glass pieces formed from crystallizable glass. In (3), Hashibe continues by first placing the flat glass pieces or "flakes" on the mold over the mold release agent to forma a layer of said pieces. A second layer comprising the glass balls or bits is then formed over the first layer which is broadly read as "filling up" the mold with glass bits. In (4), these glass bits and pieces are heat treated at a temperature capable of both causing crystallization of the glass bits and pieces where the crystals of the β -wollastonite type as well as fusion-bonding said glass bits and pieces. Hashibe also specifically notes that the heating is carried out at a temperature above the softening point of both the bits and pieces such that the glass particles deform to produce a dense, non-porous body. This deformation is understood be equivalent to the assertion in Claim 7 where "the glass flow on the surface fills in all the spaces among the fusion-bonded glass bits" and thus forming what Hashibe describes as a "dense or non-porous body". As described above, it is clear from Figure 2 that this heat treatment process is terminated or stopped before the glass bits on the surface are completely flattened.

According to the above-described procedure, Hashibe fails to explicitly lay out two elements present in both Claim 1 and Claim 7.

First, Hashibe fails to explicitly assert that the that the heat treatment should be performed at a temperature that meets or exceeds the "liquidus" temperature of the

glass bits and pieces as set forth in both immediate claims. Nakamura teaches multiple "marble-like" glass compositions in Table 1 (see excerpt below,) which fall within the compositional ranges as set forth by Hashibe in (1).

**TABLE**

| Batch No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $SiO_2$ | 59.1 | 58.4 | 61.6 | 61.7 | 59.7 | 63.9 | 60.6 | 56.6 | 59.0 | 59.0 | 59.0 | 59.0 | 60.7 | 59.0 |
| $Al_2O_3$ | 6.8 | 8.9 | 7.1 | 7.1 | 6.9 | 5.3 | 7.0 | 6.5 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| CaO | 19.1 | 21.8 | 20.0 | 20.0 | 19.3 | 19.5 | 19.6 | 18.3 | 19.1 | 19.1 | 19.1 | 19.1 | 20.8 | 19.1 |
| $K_2O$ | 1.6 | 1.8 | 1.7 | 1.7 | 1.6 | 1.8 | 1.7 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | | |
| $Na_2O$ | 1.7 | 1.8 | 1.8 | 1.8 | 1.7 | 1.8 | 3.5 | 1.7 | 1.7 | 1.7 | 1.7 | 1.7 | | |
| $B_2O_3$ | 0.6 | 2.2 | | 0.6 | 0.9 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 |
| ZnO | 6.8 | 5.1 | 7.8 | 7.1 | 9.9 | 7.1 | 7.0 | 6.5 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 | 6.8 |
| BaO | 4.3 | | | | | | | 8.2 | 4.2 | 4.3 | 4.3 | 4.2 | 4.3 | 4.2 |
| Other | | | | | | | | | 0.2 CuO | 0.1 NiO | 0.1 CoO | 0.2 $Fe_2O_3$ | | 3.5 $Fe_2O_3$ |
| Fusion temp. °C | 1440 | 1395 | 1430 | 1435 | 1440 | 1495 | 1425 | 1425 | 1440 | 1440 | 1440 | 1440 | 1450 | 1430 |
| Molding temp. °C | 1290 | 1270 | 1290 | 1295 | 1275 | 1330 | 1270 | 1265 | 1290 | 1290 | 1290 | 1290 | 1295 | 1270 |
| Liquidus temp. °C | 1230 | 1225 | 1240 | 1220 | 1195 | 1245 | 1230 | 1220 | 1230 | 1230 | 1230 | 1230 | 1190 | 1185 |

Specifically, compositions 5, 13, and 14 all meet Hashibe's preferred composition ($SiO_2$ of 50-65%, $Al_2O_3$ of 3-13%, CaO of 15-25%, and ZnO of 2-10%). Each of these compositions also presents a liquidus temperature below 1200°C (see Table 1 excerpt) which is within the preferred heat treatment temperature range as described by Hashibe in (4) above. Choosing any one of the aforementioned Nakamura compositions 14, 13, or 5 for use in the Hashibe process with a respective heat treatment temperature of 1185, 1190, or 1195°C, all of which are below the specified upper limit of 1200°C, reads on the present claims as heating the glass article at the liquidus temperature. Nakamura further asserts that since these compositions have relatively low fusion temperatures, greater differences between liquidus and molding temperatures and rapid crystal growth during reheating, marble-like bodies fabricated from these compositions are less costly that similar products made from other known compositions. It would have therefore been obvious to one of ordinary skill in the art to choose a glass

composition of the type 5, 13, and 14 described by Nakamura for use in the Hashibe process in order to reduce the cost of the fabricated marble-like body.

A second divergence between the claimed subject matter and the teachings of Hashibe is that Hashibe fails to lay out a polishing step wherein the sharp bumps are removed from the molded and heat-treated glass article. Kurahashi does explicitly state is his description of forming a marble-like glass ceramic that after molding and fusion-bonding the crystallizable glass particles (Column 6, Lines 15-24), "the samples have excellent marble-like appearance after surface (polishing)" (Column 6, Lines 33-34). Here Kurahashi is understood to polish the as molded glass article in order to enhance the final surface appearance of the marble-like glass body. It would have therefore been obvious to one of ordinary skill in the art to modify the Hashibe process to include a polishing step as taught by Kurahashi in order to improve the final appearance of a molded marble-like glass body.

Claims 2,3,4,5,8,9,10,11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashibe in view of Kurahashi and Nakamura as applied in the appropriate Claims 1 and 7 above.

Specifically regarding Claim 2 and Claim 8, Hashibe clearly sets forth in (1) above a composition of glass having $SiO_2$ of 50-65%, $Al_2O_3$ of 3-13%, CaO of 15-25%, and ZnO of 2-10% (column 2, Lines 30-31) which is broadly read as a crystallizable glass "consisting essentially of $SiO_2$, $Al2O_3$, and CaO".

Similarly regarding Claim 3 and Claim 9, Hashibe clearly sets forth in (1) above a composition of glass having $SiO_2$ of 50-65%, $Al_2O_3$ of 3-13%, CaO of 15-25%, and ZnO

of 2-10% (column 2, Lines 30-31) which is broadly read as a crystallizable glass "consisting essentially of $SiO_2$, $Al2O_3$, CaO, and ZnO".

With respect to Claims 4 and 11, Hashibe clearly sets forth in (1) above that the glass bits or "balls" should have a diameter or size of less than 10 mm (Column 2, Lines 24-25).

All of the elements of Claims 5 and 12 have been set forth as obvious according to the case presented in the Claim 1 and 7 rejections above. Specifically utilizing one of the glass compositions 5, 13, or 14 as described by Nakamura in the heat treatment process set forth by Hashibe at respective temperatures of 1195, 1190, or 1185oC and in the preferred temperature range of 1000-1200oC set forth by Hashibe would constitute a heat treatment at the "liquidus temperature". Further Hashibe stated that the resultant body is dense or non-porous which is read as "filling in all the spaces among the glass particles. Additionally, the Figure 2 in the Hashibe reference clearly indicates that the surface of the heat-treated glass article is not even.

Regarding Claim 10, Hashibe clearly indicates in (2) above that the glass pieces or "flakes" are to be of a prescribed thickness. Further, it is reasonable to assume that barring any chemical reaction during the heat treatment process that the inherent density of the glass comprising said flakes would be identical before and after said heat treatment process understanding that the density would be measured at the same temperature.

Claims 6 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashibe in view of Kurahashi and Nakamura as applied in the appropriate Claims 1 and

7 above, and in further view of Jaunzemis (US 2005/0126225 A1). Hashibe in view of Kurahashi as applied above fails to explicitly teach that the polishing of the glass article to be performed to such a degree as "to remove a limited top portion of the bumps" as set forth in claim 6 or "to produce either smooth or embossed un-even surface of the glass article" as disclosed in Claim 13. Juanzemis sets forth an explicit example of an old and well established procedure sometimes referred to as "de-burring" wherein an article presenting roughened edges is polished to create a smooth surface suitable for handling without complete elimination of surface features, topography, "bumps", or "embossments". Specifically Juanzemis presents in figure 1 (see below) a photograph of a glass surface polished by a process that yields a smooth glass piece suitable for handling (Claim 1, Line 1). It is clear from the excerpted photograph that the surface retains a degree of the surface structure and therefore is understood to remove only a limited portion of the top bumps or to produce either a smoothed but embossed uneven surface.

It would have therefore been obvious to utilize the common and well established practice of partial polishing or "de-burring" as broadly depicted by example in Juanzemis to modify the Hashibe process in order to render the molded surface of the glass article suitable for handling.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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